

Video Challenge Problem Multiple Biometric Grand Challenge Preliminary Results of Version 2

04 December 2009

National Institute of
Standards and Technology



NIST

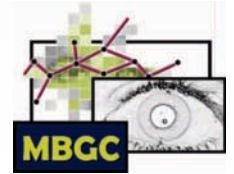
...working with industry to foster innovation, trade, security and jobs

Goals and Motivations

- Operational environment
 - Recognition from video.
 - Unconstrained illumination.
 - Unconstrained movement / pose.



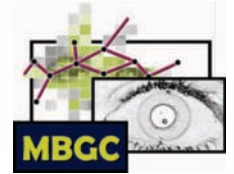
Meet the Data University of Notre Dame

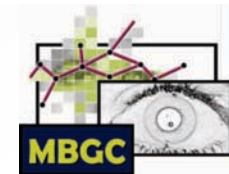


- Two different mediums of video.
 - High definition video (1440 x 1080)
 - Standard definition video (720 x 480)



Meet the Data University of Texas at Dallas





Both Data Sets Contain

- Walking footage
 - Subject walks towards camera.
- Activity / Conversation footage
 - Non-frontal footage of subject performing an activity / conversation.

Video Challenge Submissions



Organization
Pittsburgh Pattern Recognition



Walking vs. Walking

Notre Dame
976 sequences



Standard Definition
976 sequences



Notre Dame
976 sequences

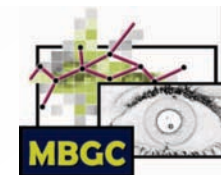


Standard Definition
976 sequences



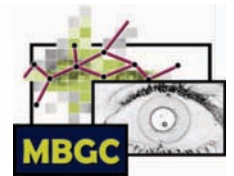
University of Texas at Dallas

Walking vs. Walking

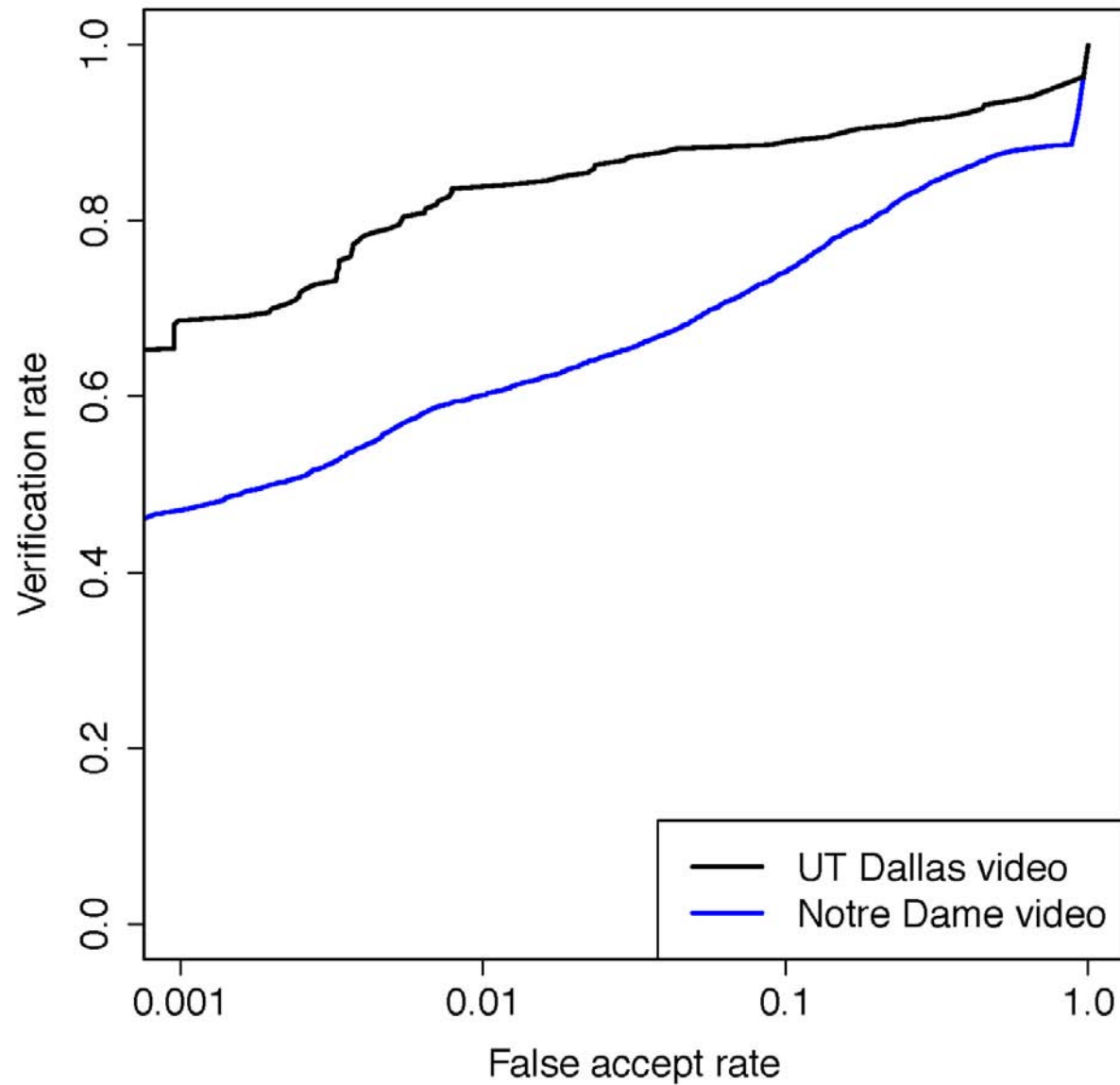


487 sequences

Walking vs. Walking Results



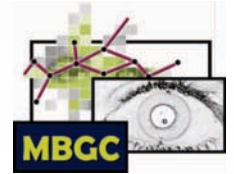
PittPatt—Walking to Walking



Results from an Open Book Challenge Problem, NOT an Independent Evaluation

Walking vs. Activity

Activity vs. Activity



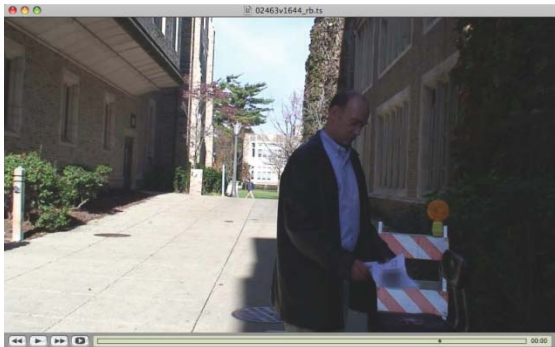
Walking

976 sequences



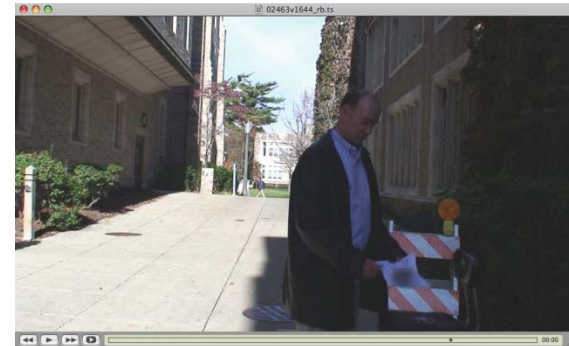
Activity

784 sequences



Activity

784 sequences



Activity

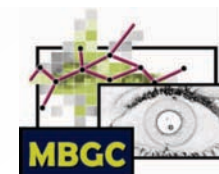
784 sequences



Experiment uses both high definition and standard definition.

Walking vs. Activity ROC

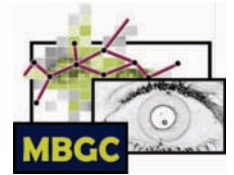
Activity vs. Activity ROC



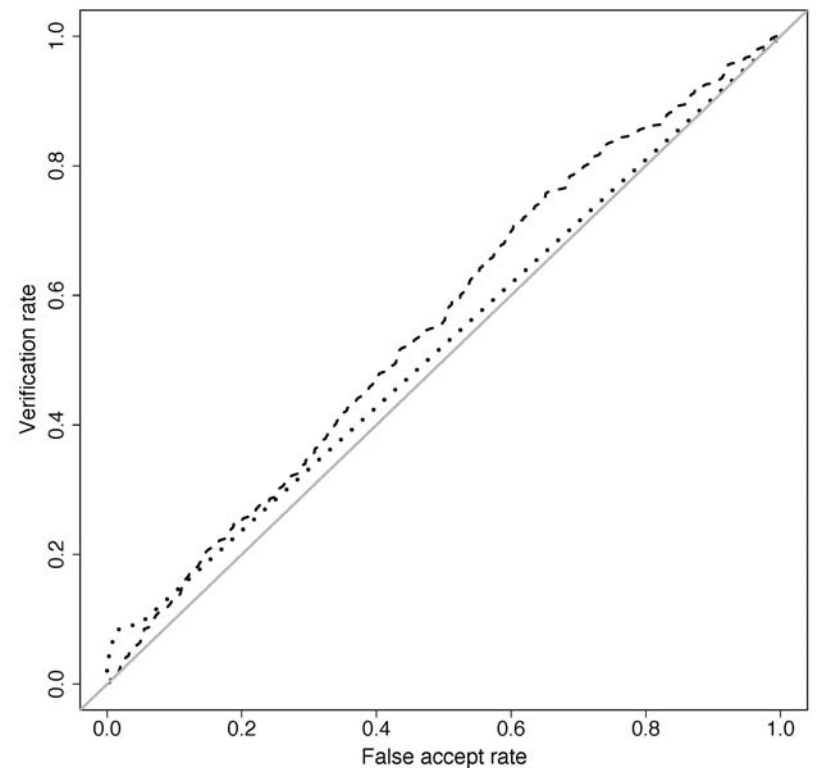
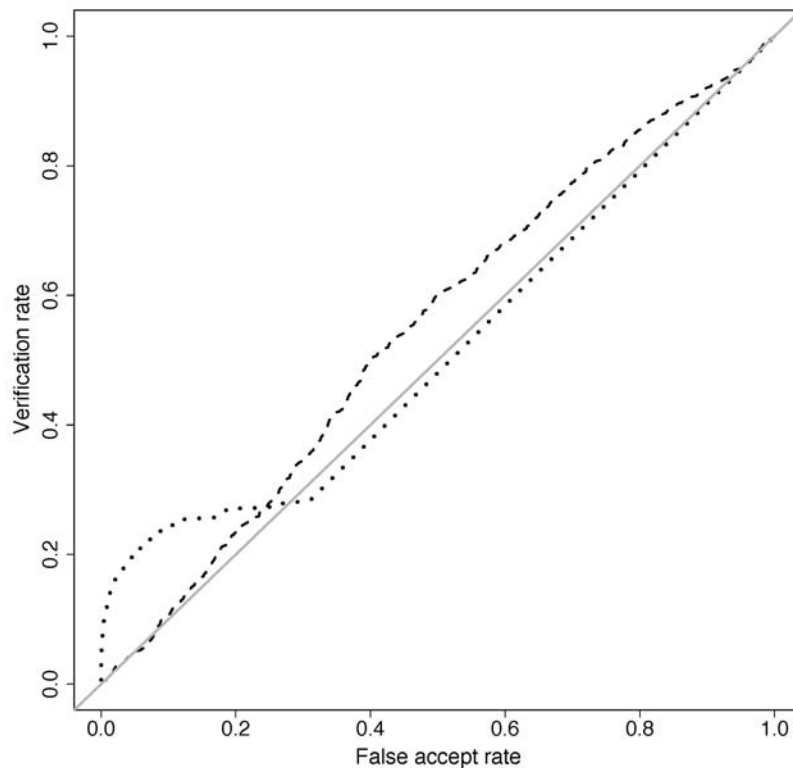
NO SUBMISSIONS

Walking vs. Activity ROC

Activity vs. Activity ROC



Reigning Champions from MBGC V1 2008

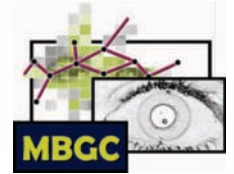


Results from an Open Book Challenge Problem, NOT an Independent Evaluation

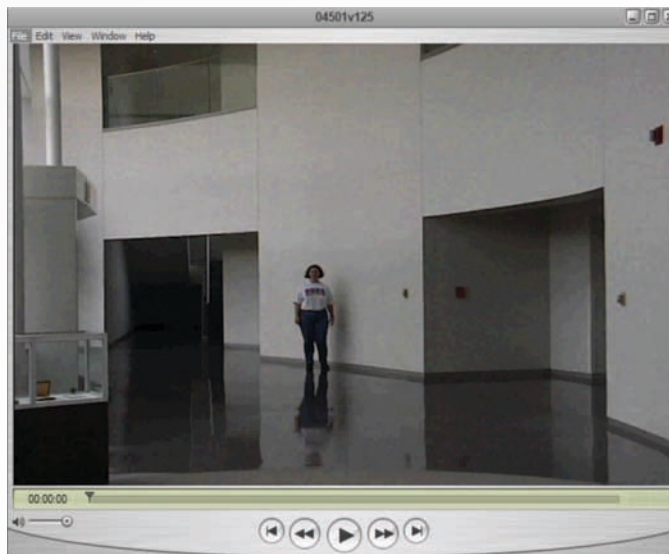
University of Texas at Dallas

Walking vs. Conversation

Conversation vs. Conversation



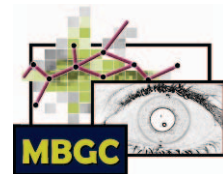
487 sequences



482 sequences



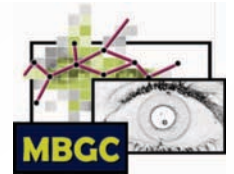
NO SUBMISSIONS



Human Benchmarking with Video

Information in Surveillance Video

What is helpful for recognition?



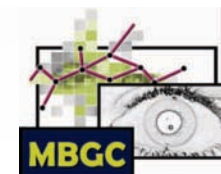
- multiple images of face
- multiple images of body
- dynamic information about gait
 - “dynamic identity signatures”
- facial motion

Walking - Walking

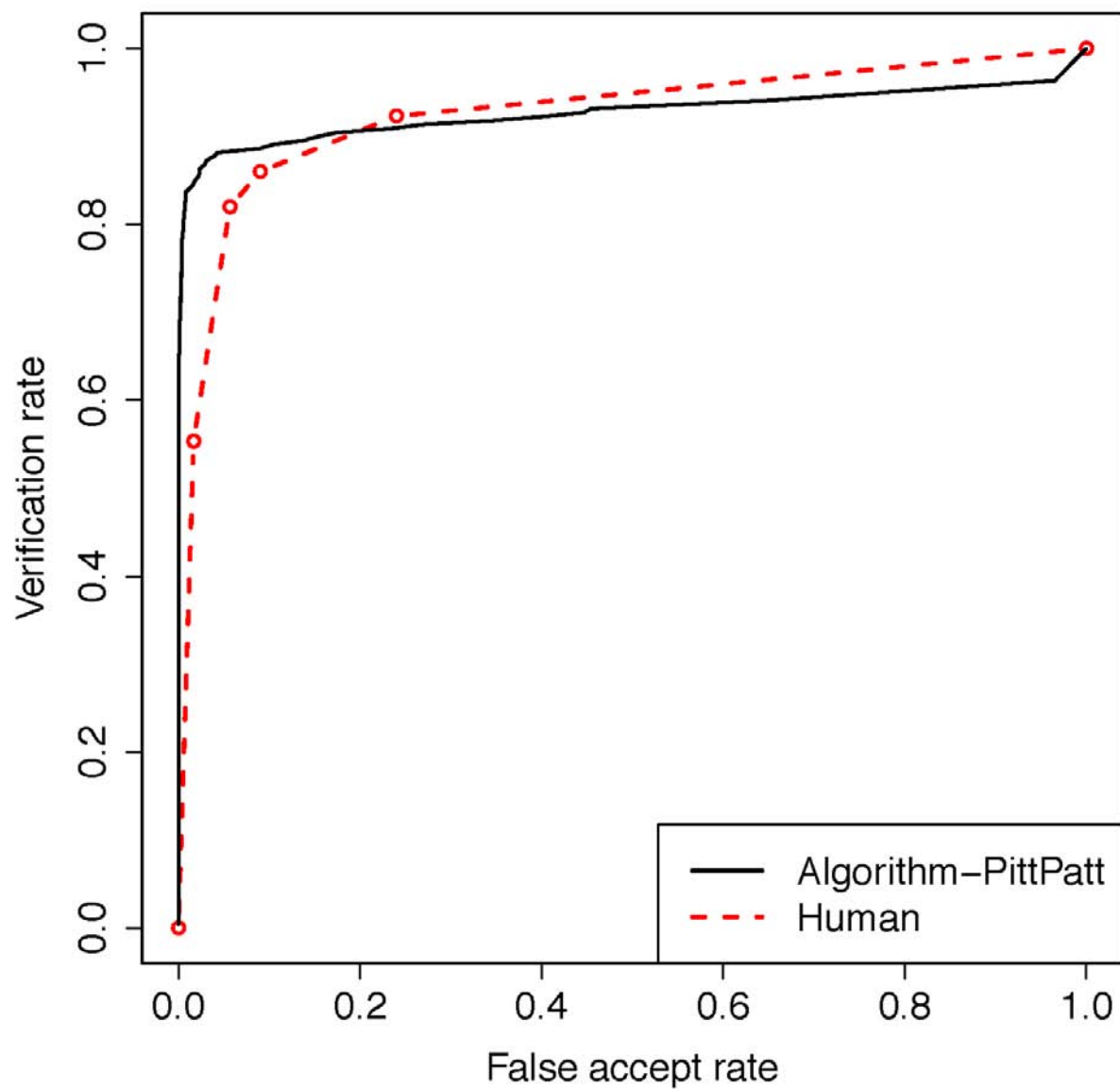


- Human subject raters respond...
 - 1. sure they are the same person
 - 2. think they are the same person
 - 3. not sure
 - 4. think they are not the same person
 - 5. sure they are not the same person

Machine & Human Performance



UT Dallas--Walking to Walking



Walking - Conversation



- Human subject raters respond...
 - 1. sure they are the same person
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 - 4. think they are not the same person
 - 5. sure they are not the same person

Conversation - Conversation

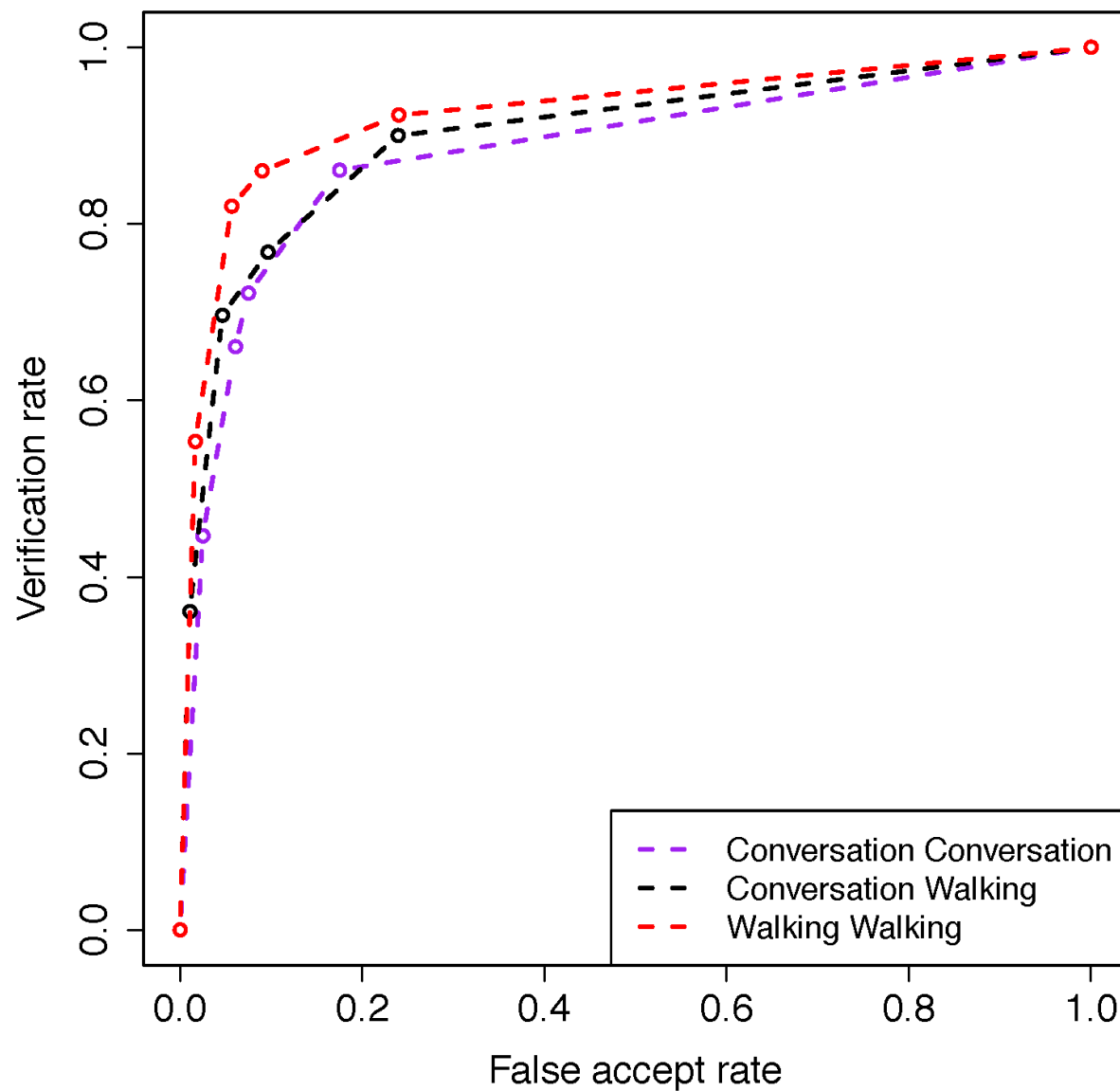


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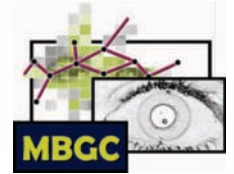
Performance All Video Conditions



Human Performance on Video Face Challenge

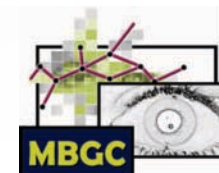


Human Performance Face Stills

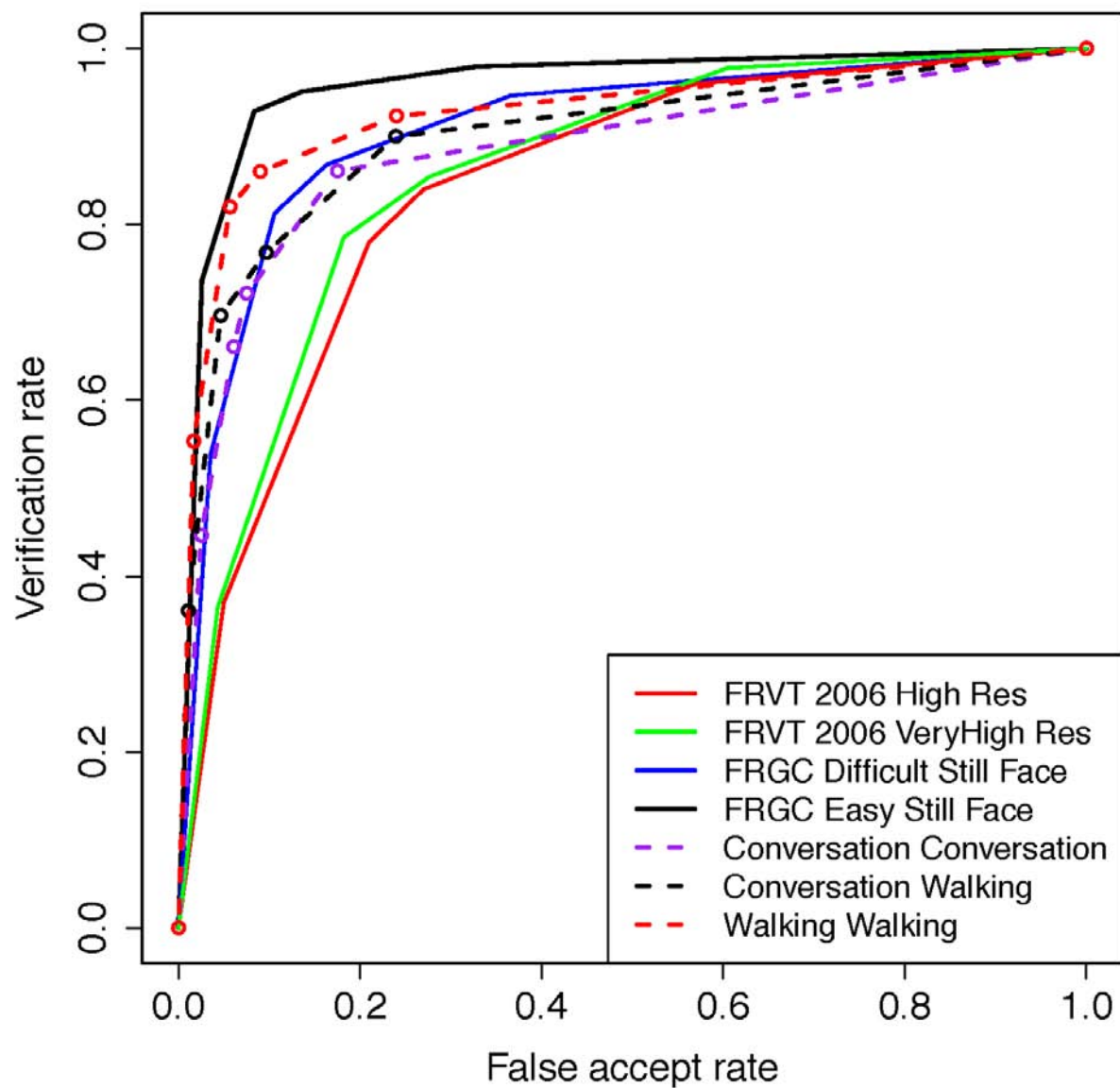


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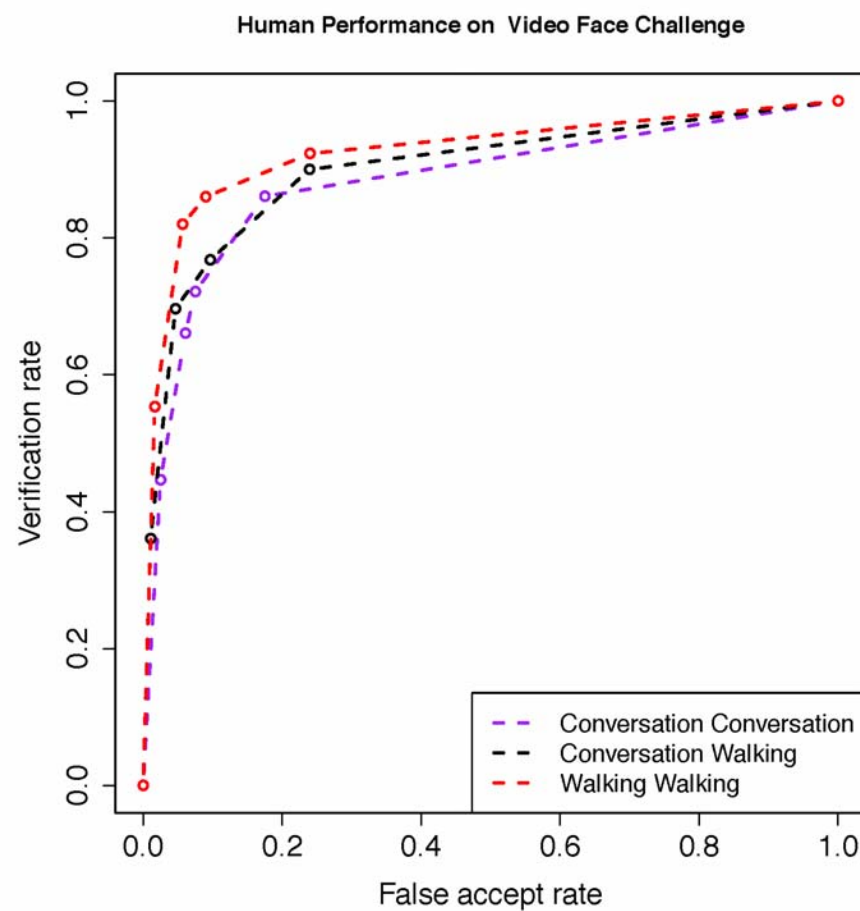
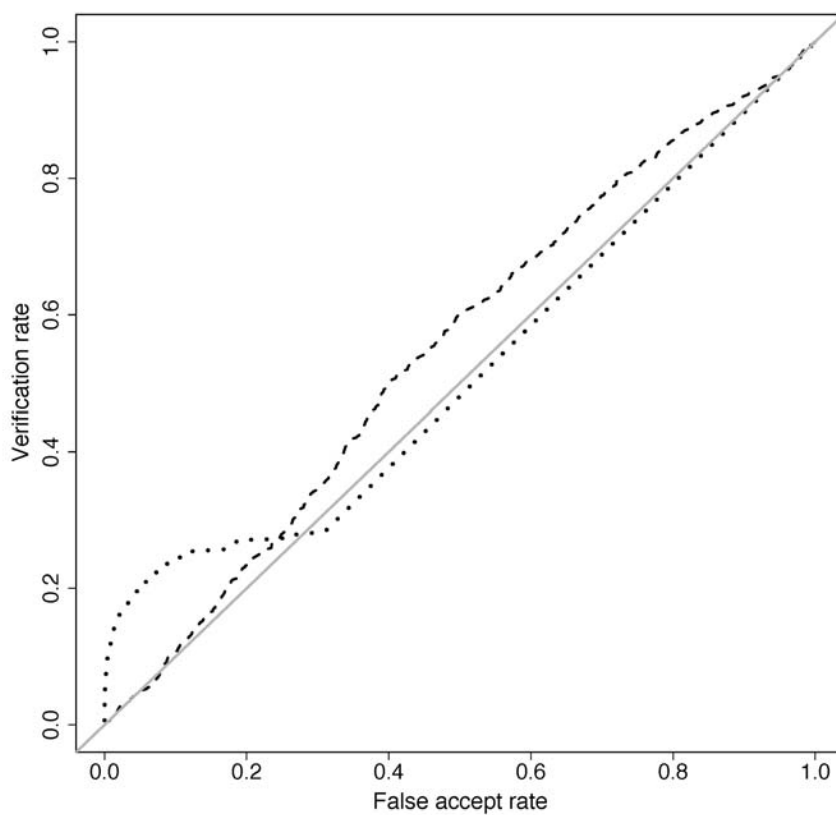
Video and Still

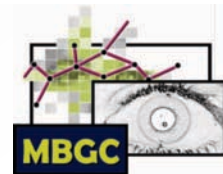


Human Performance on FRGC, FRVT 2006, and Video Face Challenge



There is Head Room





Summary

- New challenges
- Algorithms cannot handle non-frontal activity
- Human benchmark